

STANDARD SET FOR ENVIRONMENTAL SOIL RESEARCH

20.01 Environmental research set, standard set for soil and groundwater research

The basic set for environmental soil research (sampling and investigation of soil and groundwater) has been formulated on the basis of what has, in the mean time become years of experience. As well as several separate pieces of equipment, a number of smaller sets have been incorporated in this large basic set. The composition of the set is continually adapted to the latest developments in this field.

Sampling carried out with equipment from the set, as long as it is performed correctly, fulfils the most recently applied Dutch NEN specifications (5740 to 5745 inclusive) and the ISO norm 5667 part 2, 11 and 13.

The set may be used at all levels of environmental soil research. It may be worthwhile in specific cases or with very frequent use, to modify the com-

position of the set or to supplement the set further.

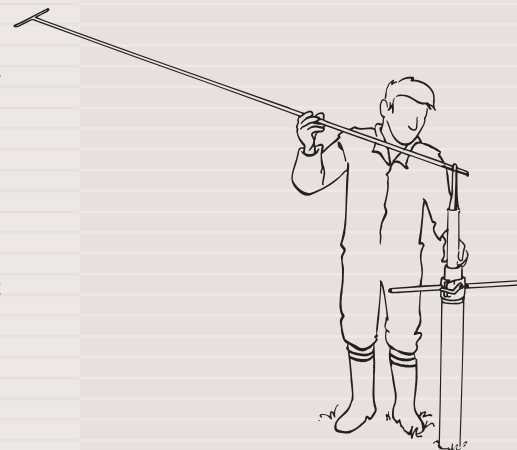
The basic set includes:

- ❑ A bailer boring auger set with non-toxic steel soil augers by which soil augering, bailer boring and soil sampling may be carried out in different types of soil.
- ❑ A soil coring kit with which sampling may be carried out in soil that needs to be investigated for the occurrence or nonoccurrence of volatile components.
- ❑ An impact type gouge which may be used for the drilling or sampling of stony soil. Where drilling is frequently performed in stony soil the acquisition of heavier percussion gouge equipment is more efficient.
- ❑ A lifting jack with chain lever for drawing out of the ground a casing, an impact type gouge or for example an unnecessary monitoring well. A piece of equipment that your back will learn to appreciate!

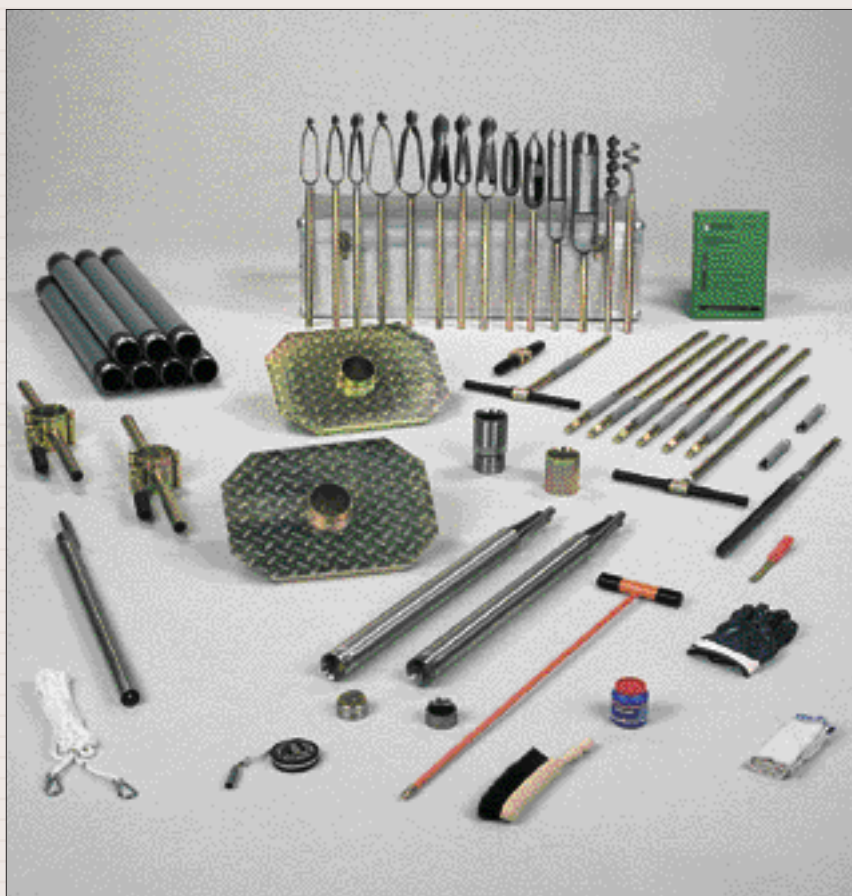


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A casing is placed within which the HDPE monitoring well pipe and filter can be installed, with the help of the hand-operated bailer boring equipment.



When in operation the bailer creates a void below the casing tube, that allows the casing tube to be driven further into the ground.



Hand-operated bailer boring auger set



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Samples for the purpose of analysis for the presence of volatile components in the soil are taken with the stainless steel soil coring kit.

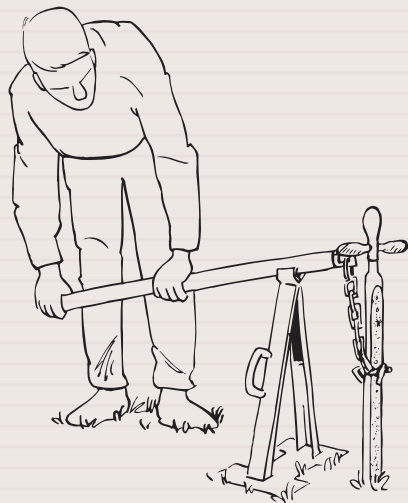


- ❑ A sand ruler (according to NEN 2560 and ISO 565) and soil colour book for the identification of soil layers in the field.
- ❑ A number of HDPE monitoring well pipes and filters, bentonite, filter gauze, monitoring well covers, etc. making it possible to place five complete monitoring wells yourself. HDPE (monitoring well material) and PE (water sampling tubes), in contrast to PVC, contain absolutely no heavy metal or weakener as additive.
- ❑ A set which includes the liquid layer sampler, by which the presence and thickness of floating layers can be determined in a monitoring well. With the same equipment a heavy liquid layer can be brought up out of a monitoring well. Ordinary (ground-)water sampling is also possible using these samplers (of water containing volatile components for instance). The set can also be used to sample

layered or non-layered liquids out of drums and various reservoirs.

- ❑ An electronic peristaltic pump with 3 memory functions for fixed rates of revolution. Using this pump, monitoring wells may be purged and sampled without recharging for a number of hours. Using the level sensor controlled purging of fluids in monitoring wells and reservoirs is possible. Disposable filters of 0.45 microns may be connected for the anoxic removal of soil particles from water samples.
- ❑ Submersible pumps, by which large amounts of water can be pumped out of monitoring wells. For instance for the development of wells that just have been installed or purging a well prior to sampling. Sampling is also possible using these pumps, except for in-line filtrations. The pumps can be powered by the electronic peristaltic pump.

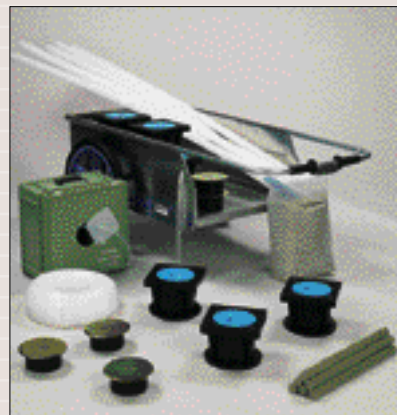
The retrieval of the impact type gouge with the help of the lifting jack and chain lever.



Soil coring kit



Lifting jack and chain lever



Monitoring well pipes and accessories



Disposable filters

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- A foot valve pump by which representative samples can be obtained from water with volatile components. Also well development and well purging is possible. Water from a very large depth may be pumped to the surface, with an output of up to 8 l/min.
- All necessary tubes in order to take water samples without any risk whatsoever of cross-contamination. The peristaltic pump and the foot valve pump have gained great popularity through the rapid changeability of their tubes. Every risk of possible cross-contamination is thereby avoided.
- A multimeter with high resolution graphic screen for the exact measurement of acidity, electrical conductivity, salinity, temperature and dissolved oxygen. The meter has a huge conductivity measuring range (up to 1000 mS/cm) and immediate reading of salinity (the salt content in grams per litre).

The measuring ranges are:

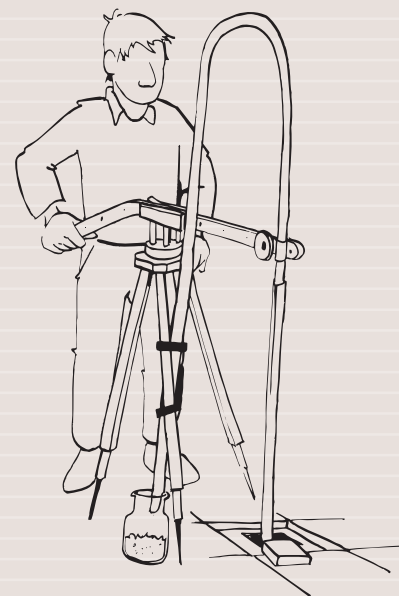
- pH 0 - 14 pH
- mV ±1200 mV
- °C 0 - 100°C
- EC 0 - 1000 mS/cm
- Sal 0 - 100 g/l
- O₂ 0 - 20 mg/l, 0 - 200%

Resolution: 0.01 pH, 1 mV, 0.1°C,
0.01 µS/cm, 0.01 mg/l, 0.1%

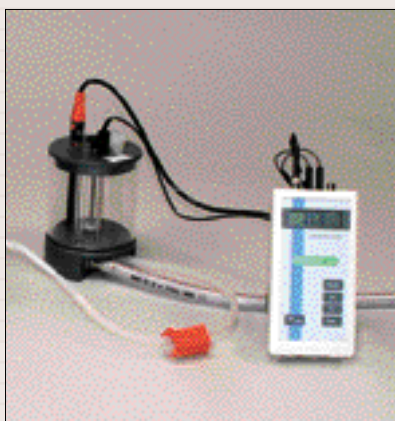
The meter has a storage memory for 200 measurements. Cell constants (EC) are 1, 10 and 0.1 cm⁻¹. Used in combination with the flow-through cell, an efficient monitoring of these parameters in the field is possible. The Multimeter meter is equipped with a synthetic pH and EC electrode and a stainless steel, Pt1000 temperature probe.

- A stainless steel bucket for (where permitted) mixing of soil or sediment samples, or for the decontamination of equipment using the supplied brushes and decontamination fluid.

Taking a water sample with the help of the hand operated foot valve pump.



Hand-operated foot valve pump



Multimeter with flow through cell

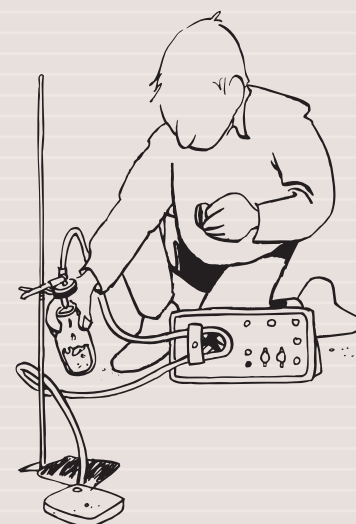


Submersible pumps



Peristaltic pump 12 Vdc

With the help of the 12 Vdc peristaltic pump and a disposable filter the water sample is filtered on site.





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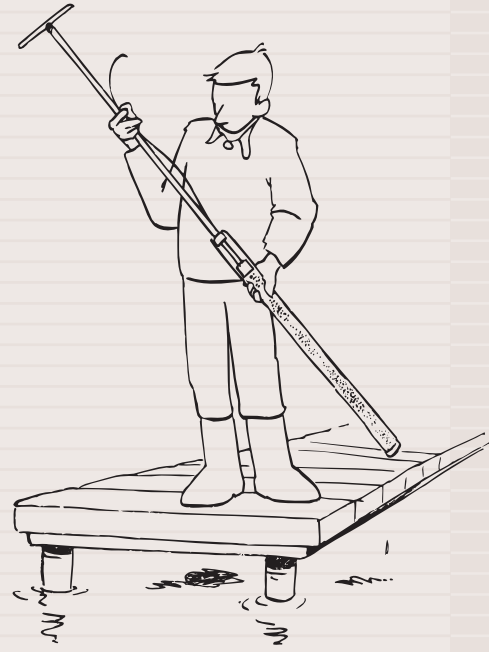
- ❑ A multisampler. With the use of this, not only undisturbed samples can be taken from water bottom layers, but a range of other samples may also be obtained; fluids or settlements in sewers for instance.
- ❑ An oil detection pan for semiquantitative field determination of the content of mineral oil in soil samples.
- ❑ For direct use in the field a part of the set can be packed away and transported in the light but sturdy transport case supplied (aluminium strengthened with plywood). The collapsible lightweight field cart makes it possible to transport equipment in the field.

20.02 Oil detection pan for semi-quantitative field determination of the content of mineral oil in soil samples

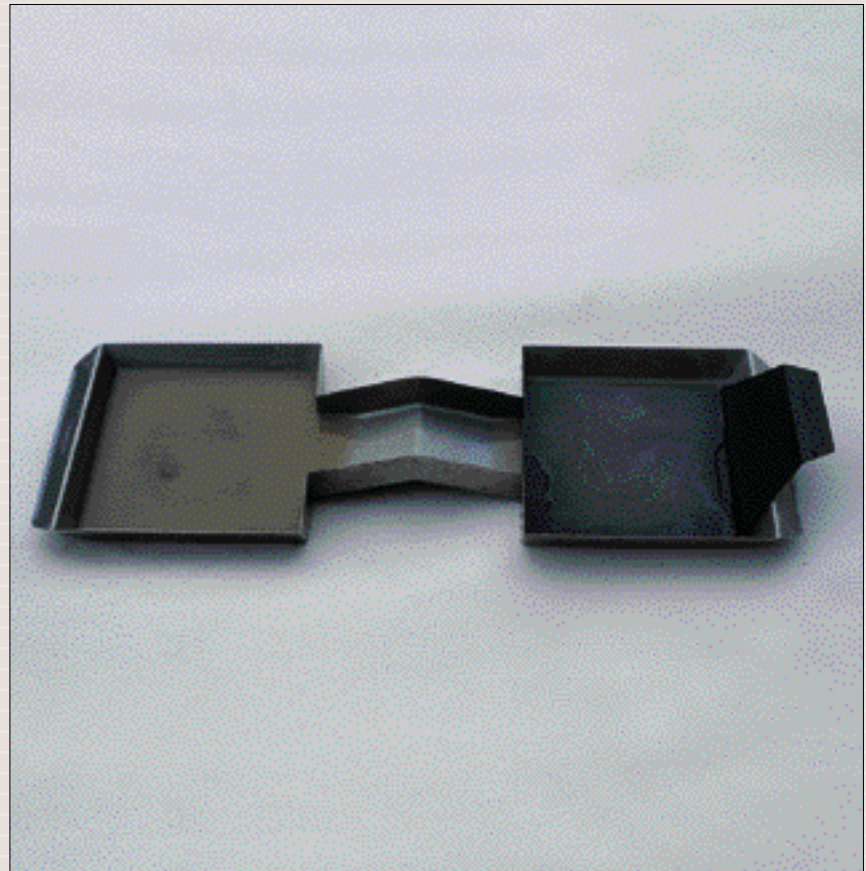
The oil detection pan is developed for a rapid on-site analysis of soil and groundwater for floating contaminants e.g. soaps, dyestuffs and all kinds of oil derivatives such as tar, lubricating oil, kerosine and petrol. In addition to laboratory analysis, rapid on-site analysis may be very useful in investigations of soil contaminations:

- ❑ Rapid monitoring of environmental conditions is necessary for safety measures during site investigation, excavation and remedial actions.
- ❑ In case of excavation, rapid decisions have to be made about the extent to which the soil is contaminated.
- ❑ The extent of the contamination can be determined more accurately in the field, which means better sampling for laboratory analysis and thus lower costs.

With the multisampler samples can also be taken of sediment layers.



To examine the sample, in the oil detection pan, water is moved to the part with the black anti-reflection plate.



Oil detection pan